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McDermott Will and Emery LLP
The McDermott Building
500 North Capitol Street, N.W.
WASHINGTON, DC 20001

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PELTON, NATHANIEL R

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte EIICHI SADAYUKI and KAZUKI YOSHIOKA

Appeal 2016-002944
Application 13/297,551[1]
Technology Center 2800

Before ADRIENE LEPIANE HANLON, CATHERINE Q. TIMM, and JAMES C. HOUSEL, *Administrative Patent Judges*.

PER CURIAM.

DECISION ON APPEAL

A. STATEMENT OF THE CASE

Appellants filed an appeal under 35 U.S.C. § 134(a) from the Examiner's decision finally rejecting claims 1, 2, 4, and 5 under 35 U.S.C. § 103(a) as being unpatentable over Mizoguchi[2] in view of von Kaenel,[3] and rejecting claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Mizoguchi in view of Dlugos[4] and von Kaenel. We have jurisdiction under 35 U.S.C. § 6(b).[5]

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[1] According to Appellants, the real party in interest is Panasonic Corporation. Appeal Br. 1.
[2] Mizoguchi, US 6,340,852 B1, issued Jan. 22, 2002 ("Mizoguchi").
[3] von Kaenel, US 2007/0001747 A1, published Jan. 4, 2007 ("von Kaenel").
[4] Dlugos et al., US 6,191,687 B1, issued Feb. 20, 2001 ("Dlugos").
[5] Our decision refers to the Appellants' Specification filed Nov. 16, 2011 (Spec.), the Final Office Action mailed Jan. 8, 2015 (Final Act.), the Appeal Brief filed

We REVERSE.[6]

The subject matter on appeal relates to power source generating circuits and an integrated circuit (*see, e.g.*, claims 1 and 10). Appellants disclose that utility meters, such as water meters, use sensors that generate a pulse signal and an integrated circuit that counts the number of pulses to measure an amount of utility (e.g., amount of water) consumed. Spec. 1:16–21. The integrated circuit for such a meter can be battery-free because the integrated circuit may acquire electrical power from the pulse signals generated by the sensor. *Id.* at 1:21–24. Such devices should quickly generate an internal power source voltage for the integrated circuit so a sufficient level of power source voltage is available for the integrated circuit. *Id.* at 1:29–33.

Appellants disclose that conventional power source generation circuits include capacitors to stabilize the circuit and counter noise. *Id.* at 2:23–31. A period of time is required to charge the capacitors after an external power source (e.g., a pulse signal) is received, causing the conventional power source generation circuits to not achieve a required responsiveness. *Id.* at 2:31–3:3. Appellants address this problem by disclosing a power source generation circuit including, among other things, a regulator circuit that receives an external power source voltage from an external power source and a charging circuit connected to the external power source, wherein the charging circuit connects the external power source and a terminal when the external power source voltage is equal to or lower than a first threshold voltage. *Id.* at 3:9–17. Appellants disclose an embodiment of a power source generation circuit in which the external power source voltage is

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Aug. 12, 2015 (Appeal Br.), the Examiner's Answer mailed Nov. 24, 2015 (Ans.), and the Reply Brief filed Jan. 22, 2016 (Reply Br.).

[6] Claims 3 and 6–9 have been indicated as including allowable subject matter. Final Act. 6.

supplied by the charging circuit before the generating circuit generates a predetermined internal power source voltage. *Id.* 10:25–11:27.

Independent claim 1 is illustrative and is reproduced below from the Claims Appendix of the Appeal Brief.[7] The limitation at issue is italicized.

> 1. A power source generation circuit comprising:
>
> a regulator circuit which receives an external power source voltage from an external power source, generates a predetermined internal power source voltage on a given terminal, and includes a first switching transistor, one of a source and a drain of the first switching transistor being connected to the external power source; and
>
> a charging circuit which is connected to the external power source, and connects the external power source and the given terminal when the external power source voltage received from the external power source is equal to or lower than a first threshold voltage,
>
> *wherein the charging circuit is configured to supply the external power voltage to the given terminal before the regulator circuit generates the predetermined internal power source voltage on the given terminal.*

B. DISCUSSION

Claims 1, 2, 4, and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mizoguchi in view of von Kaenel. We select claim 1 as representative for resolving the issues on appeal.

The Examiner finds Mizoguchi discloses a power source generation circuit that includes a regulator circuit, which receives an external power source voltage and generates a predetermined internal power source voltage on a given terminal, and a charging circuit that connects the external power source and the given terminal when the voltage received from the external power source is equal to or lower than a first threshold voltage, citing Figures 1 and 11 of Mizoguchi. Final Act. 2–3. The Examiner finds Mizoguchi does not disclose that the charging

[7] Appeal Br., Claims Appendix 17.

circuit is configured to supply the external power voltage to the given terminal before the regulator circuit generates the predetermined internal power source voltage, as recited in claim 1. *Id.* at 3.

The Examiner finds von Kaenel discloses a charging circuit configured to supply an external power voltage to a terminal before a regulator circuit generates a voltage, citing Figure 1 and paragraphs 16–19 of von Kaenel. *Id.* The Examiner concludes it would have been obvious to modify Mizoguchi to configure its charging circuit to supply external power to a capacitor before its regulator to allow its circuit to operate more rapidly, as taught by von Kaenel. *Id.* at 4.

Appellants contend the combination of Mizoguchi and von Kaenel does not disclose all of the recitations of claim 1 because the Examiner finds Mizoguchi does not disclose a charging circuit "configured to supply the external power voltage to the given terminal before the regulator circuit generates the predetermined internal power source voltage on the given terminal," as recited in claim 1, and von Kaenel discloses supplying a voltage via capacitor **26**.[8] Appeal Br. 5–6. Appellants argue von Kaenel's capacitor **26** does not supply an "external power voltage," as recited in claim 1, because the voltage supplied by the capacitor **26** is internally generated. *Id.* at 6. Appellants further note that both the regulator circuit and charging circuit of claim 1 are connected to the external power source that provides the external power source voltage. *Id.*

Appellants' arguments are persuasive. The invention of von Kaenel is directed to providing a supply voltage to an integrated circuit in an electronic system. von Kaenel ¶ 2. von Kaenel discloses a common power management technique is to power down a processing unit (CPU) if it is not being used. *Id.* at ¶

[8] Throughout this Decision, for clarity, we present labels to elements in figures in bold font, regardless of their presentation in the original document.

5. However, when a user requires its operation, a rapid response time is needed from the powered-down state. *Id.* ¶ 5. To address this issue, von Kaenel discloses a system **10** including, among other things, integrated circuit **12**, main voltage regulator **18**, control circuit **22**, and capacitor **26**. *Id.* ¶ 15. von Kaenel discloses control circuit **22** causes capacitor **26** to be coupled to node **34** in response to a wakeup signal. *Id.* ¶ 17. Capacitor **26** is pre-charged, so when capacitor **26** is coupled to node **34**, capacitor **26** rapidly ramps up the voltage of node **34**. *Id.* As a result, "the integrated circuit **12** may begin operating prior to the main regulator **18** providing the supply voltage on the node **34**." *Id.* ¶ 18.

Therefore, the voltage supplied to node **34** of von Kaenel by capacitor **26**, prior to the main regulator **18** providing a voltage to node **34**, is not an external power source voltage, as recited in claim 1, but a voltage provided via an internal component (i.e., capacitor **26**), as argued by Appellants. As a result, the disclosure of von Kaenel does not remedy the deficiencies of Mizoguchi.

The Examiner responds to Appellants' arguments by stating "the capacitor **26** of von Kaenel was not relied upon as teaching the claimed external power voltage" and that "Mizoguchi was relied on as teaching an external power source." Ans. 3. However, as noted above, neither Mizoguchi nor von Kaenel discloses a charging circuit "configured to supply the external power voltage to the given terminal before the regulator circuit generates the predetermined internal power source voltage on the given terminal," as recited in claim 1. The Examiner also finds von Kaenel "explicitly teaches supplying a power 'to the given terminal before the regulator circuit generates the predetermined internal power source voltage on the given terminal.'" *Id.* at 4. This, however, does not address the requirement of claim 1 that the charging circuit be "configured to supply the *external power voltage* to the given terminal" (emphasis added), not merely supply

a generic "power," as the Examiner finds. Thus, the Examiner has not set forth a prima facie case of obviousness.

The Examiner finds in the Examiner's Answer that Mizoguchi discloses an internal power supply voltage is directly supplied to internal power supply interconnection **20** when the external power supply voltage is 3.3 V but the regulator **30** of Mizoguchi is activated when the external power supply voltage is 5 V, citing column 6, lines 47–67, of Mizoguchi. Ans. 5. The Examiner determines "when the external power supply voltage (after stabilization) VCE starts, for example, at 3.3V and increases to 5V, it is very clear that Mizoguchi's charging circuit supplies the external power voltage to the given terminal before the regulator circuit generates the predetermined internal power source" and thus "Mizoguchi's circuit is already capable of performing that function" (i.e., of supplying the external power voltage to the internal power supply interconnection **20** before the regulator **30** generates its internal power source voltage). *Id.*

Appellants respond to the Examiner's findings by first arguing it is unlikely that, after it has stabilized, the external power supply voltage would increase from 3.3 V to 5 V because "[t]he external voltage is set to one voltage when stabilized, under the disclosed situations of Mizoguchi." Reply Br. 5. This argument is persuasive. Moreover, the Examiner provides no support in the disclosure of Mizoguchi to support the finding that the external supply voltage of Mizoguchi, *once stabilized*, can increase from 3.3 V to 5 V and the voltage generating circuits of Mizoguchi would operate in the manner described at page 5 of the Examiner's Answer. For example, column 6, lines 47–67, of Mizoguchi do not describe the external power supply voltage increasing from 3.3 V to 5 V after it has stabilized or disclose a circuit that would function in the manner described by the Examiner.

Furthermore, Appellants assert the voltage generating circuit depicted in Figure 11 of Mizoguchi, which is cited by the Examiner in the rejection,[9] does not supply the external power supply voltage or the output voltage of regulator circuit **30** until transistor **76** is turned on. Reply Br. 5–6.

This argument is also persuasive that the Examiner reversibly erred. Mizoguchi's third embodiment is depicted in Figure 10 and a modification of the third embodiment is depicted in Figure 11. Mizoguchi 12:18–20 and 12:51–53. Mizoguchi discloses the following for voltage generating circuit **300** depicted in Figure 10:

> *Voltage generating circuit **300** disconnects regulator circuit **30** and voltage switch transistor **50** and external power supply interconnection **10** to stop the supply of voltage to internal power supply interconnection **20** until external power supply voltage VCE attains a steady state.* After external power supply voltage VCE is stable, voltage generating circuit **300** turns on voltage cut off transistor 76 to perform the same operation as that of voltage generating circuit **100**.

Id. at 12:27–35 (emphasis added). Thus, transistor **76** prevents the supply of a voltage from external power supply interconnection **10** and regulator circuit **30** to internal power supply interconnection **20** until the external power supply voltage VCE is in a steady state. Transistor **76** is also present in voltage generating circuit **310** depicted in Figure 11, which Mizoguchi discloses as having a similar configuration and operation as circuit **300** of Figure 10, except voltage comparison circuit **41** replaces comparator **40** of Figure 10. *Id.* at 12:54–60. The disclosure of Mizoguchi regarding Figures 10 and 11[10] also makes no reference to the external power supply voltage VCE increasing from 3.3 V to 5 V once the external power

[9] Final Act. 2–3.
[10] Mizoguchi 12:18 to 13:3.

supply voltage VCE has stabilized or to how the circuits of the third embodiment would function in such a situation.

In view of the above, there is no support in the disclosure of Mizoguchi that the embodiment of Figure 11 would function in the manner described by the Examiner once the external supply voltage has stabilized or that the external supply voltage would even increase from 3.3 V to 5 V after stabilization. Moreover, as argued by Appellants at pages 6–7 of the Reply Brief, the Examiner cites column 6, lines 47–67, of Mizoguchi to support the findings at page 5 of the Examiner's Answer, but this portion of Mizoguchi's disclosure regards Figure 1 of Mizoguchi. Mizoguchi discloses the circuit of Figure 1 "suffers from the problems associated with the conventional circuit" and describes the circuit of Figure 2 as "the first embodiment of the present invention." *Id.* at 7:12–13 and 7:21–23. As discussed above, the embodiment of Figure 11 functions differently by stopping the supply of voltage to internal power supply interconnection **20**, via transistor **76**, until external power supply voltage VCE attains a steady state.

For the reasons set forth above, the rejection of claim 1 under § 103 over Mizoguchi in view of von Kaenel is not sustained. We reverse the § 103 rejection of dependent claims 2, 4, and 5 over the combination of Mizoguchi and von Kaenel for the same reasons.

The § 103 rejection of claim 10 over Mizoguchi in view of Dlugos and von Kaenel suffers from the same deficiencies as the §103 rejection of claim 1. Although the remaining § 103 rejection includes Dlugos as an additional prior art reference, the Examiner does not rely on Dlugos to remedy the above-discussed deficiencies in the combination of Mizoguchi and von Kaenel. Therefore, we likewise do not sustain the Examiner's § 103 rejection of claim 10 over Mizoguchi, Dlugos, and von Kaenel.

DECISION

On the record before us and for the reasons given in Appellants' Appeal and Reply Briefs, we *reverse* the Examiner's § 103 rejections.

REVERSED